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INTERNAL CORRESPONDENCE

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TO: GERRY SOTOLONGO
FROM: GREGORY ROSCOE *GR*
SUBJECT: MARSH ISLAND SOIL SAMPLES
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On February 14, 1984, the NUS Field Investigation Team (FIT) collected 7 surficial soil samples from the Marsh Island site located in Fairhaven, MA. On the day of sampling, the temperature was approximately 40°F, overcast with intermittent drizzle.

All samples were collected from the top 6" of soil with a stainless steel trowel. Samples were placed in precleaned, 16 oz. glass, wide mouth containers. Sampling equipment was decontaminated between each sample location with an alcanox wash, water rinse, methanol rinse, water rinse.

Prior to sampling, a preliminary survey was conducted to determine potential sample locations. Selection of sample locations was based upon an area's perceived frequency of access by the public. Factors which were considered included ease of access, evidence of travel (paths, access roads, etc.) and evidence of use (graffitti, discarded beverage containers, etc.).

A total of 6 soil samples were collected from the peninsula itself, and 1 soil sample was collected from an area adjacent to the peninsula. In addition, a potting soil blank was taken into the field during sampling. The locations from which soil samples were collected are illustrated in figure 1.

SAMPLE ANALYSIS

The Marsh Island related samples were screened for PCBs by NUS/FIT using a procedure developed at EPA/NERL in Lexington, MA. The screening procedure utilizes gas chromatography in conjunction with an electron capture detector. The instrument used is an AID portable gas chromatograph employing a 4' stainless steel column packed with 3% SE-30.

- Extraction

Sample aliquots weighing from 100 to 400 mg were extracted in 100 microliters of water, 500 microliters of methanol, and 500 microliters of hexane. An aliquot of the hexane fraction (1 or 2 λ) was injected into the GC.

- Analysis

Any resulting peak patterns were analyzed by comparing sample patterns to those generated by EPA liquid PCB standards for Aroclors 1242 and 1254. If recognizable Aroclor patterns are identified in a chromatograph, quantitation is done using peak height comparisons, usually of one peak.

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QUALITY CONTROL

In addition to running periodic liquid PCB standards, EPA Quality Control samples of PCB in sediments were run as a check on extraction efficiency and a relative measure of the accuracy of quantification. In addition, a field blank was run at the end of the analyses to monitor the potential for extraneously induced contamination.

RESULTS

The results of the PCB screening are given in Table 1. All aliquots of the samples collected from or in the vicinity of the Marsh Island peninsula screened low for PCBs. No aliquot screened higher than 1 ppm. A description of the physical characteristics of each sample is given in Table 2.

DISCUSSION

Based upon the screening which was conducted on the samples collected from the Marsh Island peninsula, it appears that there is not a significant PCB contamination problem associated with the surficial soil material at this site. However, this assumption is made with several caveats. First, the sample location selections were subjective and may not be representative of contamination distribution over the entire peninsula. Although a relatively small number of samples were taken and analyzed, an attempt was made to sample those areas exhibiting evidence of public access. Therefore, even though the extent of sampling coverage was not comprehensive, the selection of sample locations was based upon optimizing sample coverage from areas presenting the potential for human exposure. Second, the analytical procedure used is a screening tool developed for rapid, economical processing of large numbers of samples. This technique is semi-quantitative, giving excellent correlation to relative degrees of contamination. This technique is therefore an excellent indicator of relative degrees of contamination but is not meant to replace more sophisticated extraction and analytical techniques providing a higher degree of quantitative confidence.

QC ITEMS

When assessing the screening technique based upon values obtained from analyses of the EPA soil standards, it is important to realize that the values given for the soil standards were derived from different extraction and analytical protocols than

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those used in this screening technique. Therefore, the EPA reference values should be used only as a relative guide to gauge the efficacy of a specific analysis. These values are not intended to be used as a strict QC cut off to judge the validity of an analysis.

Analysis of the EPA soil standard was conducted on replicate extractions of the same standard (the extractions were designated 219_a and 219_b). There appeared to be a fairly good correlation between extractions^a except for one analysis which resulted in a calculated concentration of Aroclor 1254 of 0.5 ppm (see Table 1) as opposed to the EPA calculated value of 6.5 ppm. This particular analysis of EPA Std. #219 was different from the other analyses in that it reflected a 1 λ injection versus a 2 λ injection for the other 2 analyses. Therefore, the reported value of 0.5 ppm for Aroclor 1254 probably reflects a poor injection, due in part to the error associated with manipulating very small volumes. Subsequent to this analysis, all further injections were 2 λ in volume in the hopes this volume would be more accurately delivered. Comparison of the 2 λ injections suggests that the analyses are relatively reproducible.

GAR/bjb

cc: R. DiNitto
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TABLE 1
MARSH ISLAND
SAMPLE RESULTS

<u>STATION NO.</u>	<u>SAMPLE ID</u>	<u>1242*</u>	<u>1254*</u>
-	219 _{b2}	6.5	2.3
MI001	MI001	ND	<1
MI002	MI002	UD	UD
MI003	MI003	UD	UD
-	219 _{a1}	ND	0.5
MI004	MI004	UD	UD
MI005	MI005	ND	<1
MI006	MI006	UD	UD
MI007	MI007	ND	<1
MI008(blank)	MI008(blank)	UD	UD
	219 _{a2}	3.7	2.5

*wet weight concentration (ppm) of PCB Aroclors 1242 or 1254

219_{a,b} - EPA soil standards; group 3, #219; a,b referring to separate extractions of the same standard and the number following the letter (1,2) reflecting the injection volume in ul. Reference values for this standard are:

PCB 1242 7.83 ppm 2.47 - 13.20 (95% confidence interval)
PCB 1254 6.48 ppm 3.74 - 9.22

<1 - PCBs were detected, but at a value <1 ppm

ND - not determined, unable to conclusively identify specific aroclor

UD - Aroclor not detected

TABLE 2
MARSH ISLAND
SAMPLE SOIL TYPE CHARACTERIZATION

<u>SAMPLE ID</u>	<u>DESCRIPTION</u>
MI001	fine, sandy, sediment like material with high organic content, wet
MI002	medium sand with gravel, damp
MI003	poorly graded, fine silt to gravelly top soil, high organic content, damp
MI004	medium sand with gravel, damp
MI005	poorly graded, fine silt to gravelly top soil, high organic content, damp
MI006	fine sand with gravel (minor component), some organic material, damp
MI007	poorly graded, fine silt to gravelly top soil, medium organic content, damp
MI008	potting soil (blank)

